

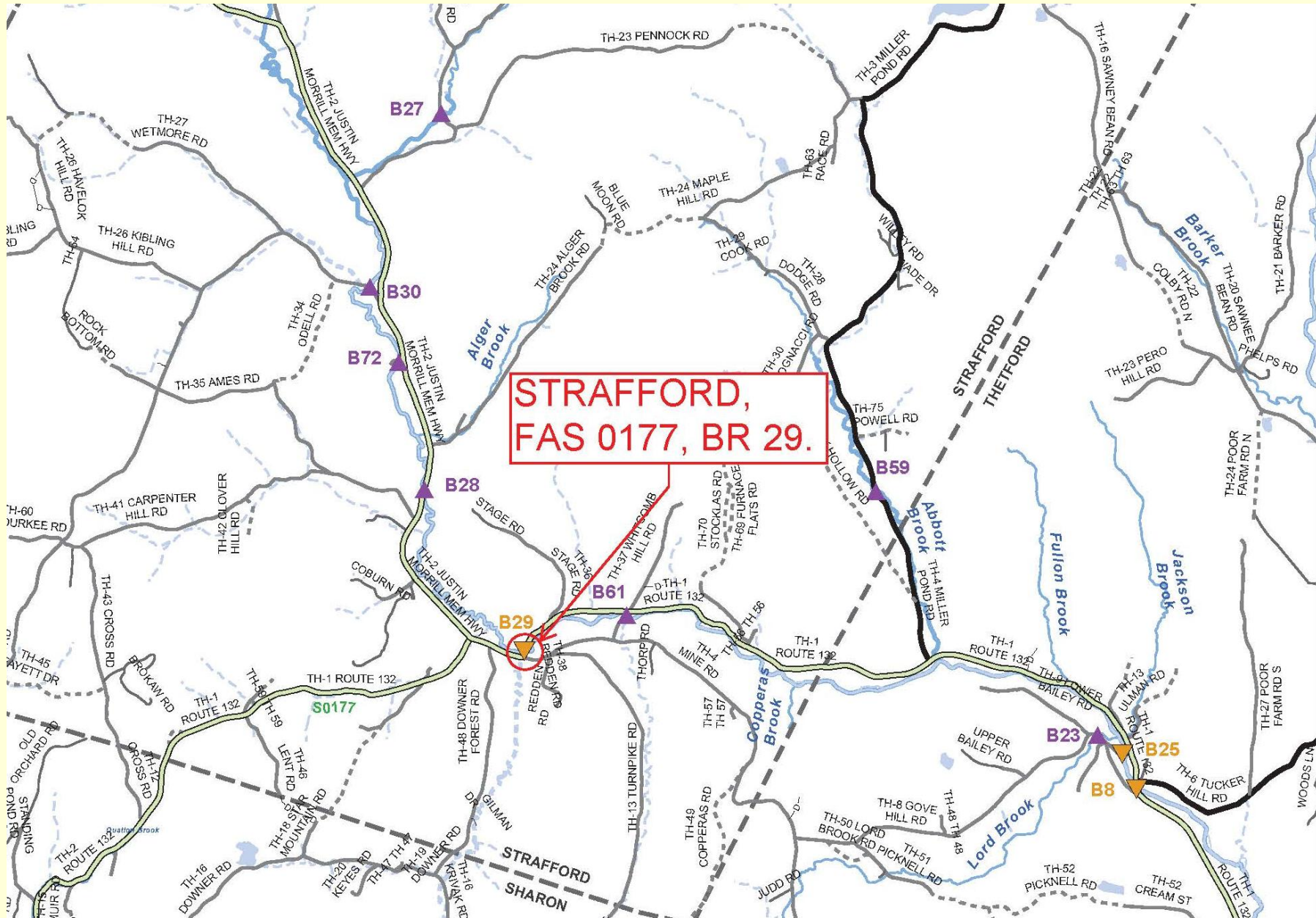
Strafford BF 0177(10) Bridge 29 on VT Route 132 (FAS 177) over the West Branch of Ompompanoosuc River Alternatives Presentation



**Presented by
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September 10, 2013

PROJECT LOCATION



Meeting Outline

- Purpose of the Meeting
- Structures Section Re-organization
- Existing bridge deficiencies
- Alternatives considered
- Summary and recommendation
- Next Steps

Purpose of Meeting

- Present the alternatives that we have considered
- Explain the constraints to the project
- Help you understand our approach to the project
- Provide you with the chance to ask questions
- Provide you with the chance to voice concerns
- Build consensus for the recommended alternative-

Accelerated Bridge Program

- Began in January 2012
- Bridges are deteriorating faster than we can fix them
- Short-term closures are key
- Impacts to property and resources is minimized
- Less impacts = less process = less money = faster delivery
- Accelerated Bridge Construction (ABC) is very efficient
- Shift from individual projects to programmatic approach
- Accelerated Project Delivery is the result
- Goal of 25% of projects into Accelerated Bridge Program
- Goal of 2 year design phase for ABP (5 years conventional)

Project Initiation & Innovation Team

- Part of re-organization in January 2012
- Currently team of 5
- All projects will begin in the PIIT
- Very efficient process
- Look for innovative solutions whenever possible
- Involved until Project Scope is defined
- Hand off to PM to continue Project Design phase

Phases of Development

Project
Funded

Project
Defined

Contract
Award

Project Definition

Project Design

Construction

Identify resources &
constraints

Evaluate alternatives

Public Participation

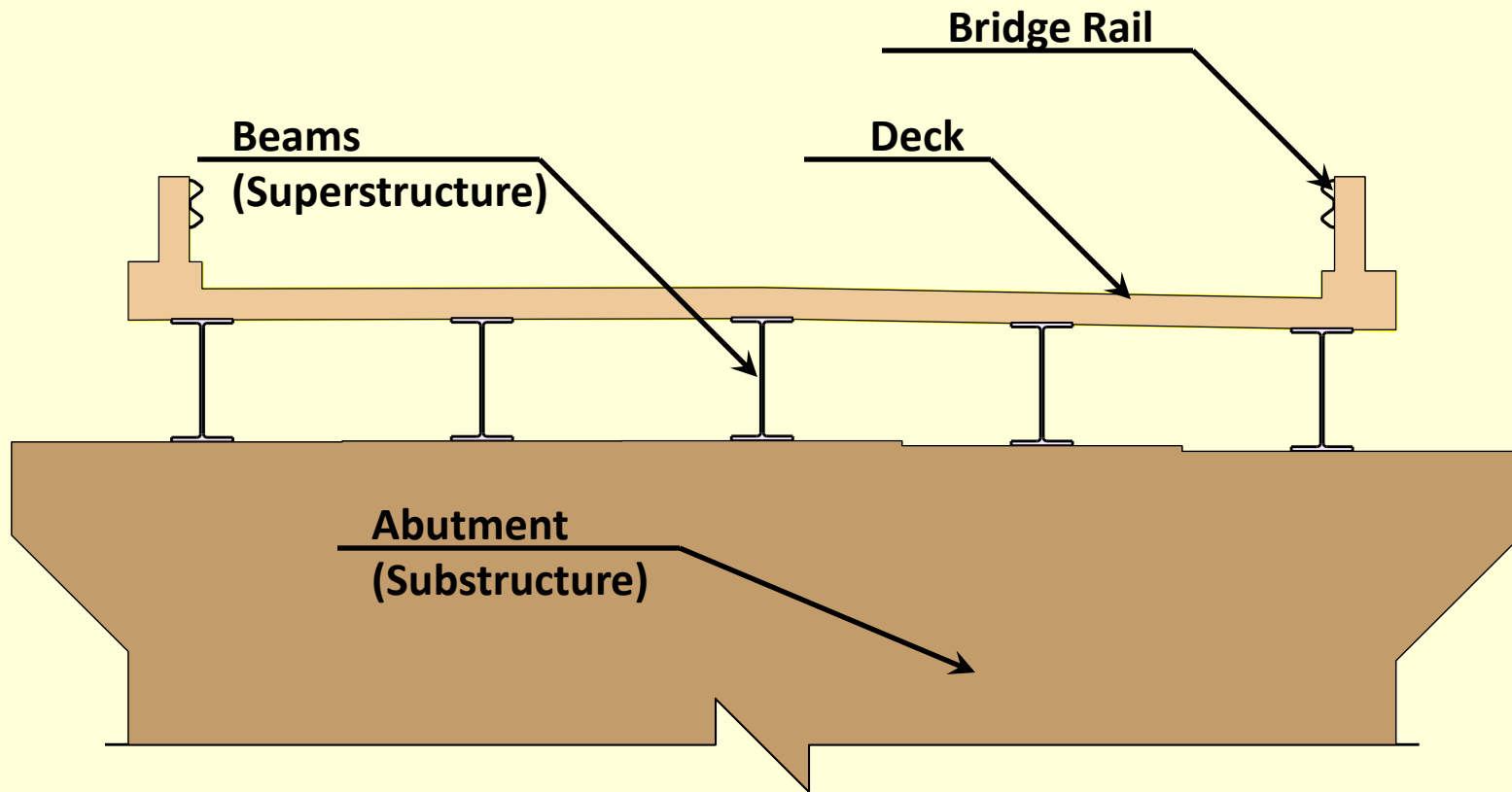
Build Consensus

- Quantify areas of impact

- Environmental permits

- Develop plans, estimate and specifications

Description of Terms Used



Project Background

- The structure is owned and maintained by the Town
- VT Rte 132 (FAS 177) is a Class 2 Town Highway
- Functionally labeled as a Rural Major Collector
- Posted Speed = 25 mph (Design Speed)
- Existing bridge is a single span concrete T-Beam
- Span length = 46 feet
- Bridge Width = 20.6 feet
- The bridge was built in 1923 (90 years old)

Traffic Data

	“Current Year” 2016	“Design Year” 2036
Average Annual Daily Traffic	1,400	1,500
Design Hourly Volume	180	190
Average Daily Truck Traffic	65	110
%Trucks	3.7	6.0

EXISTING BRIDGE DEFICIENCIES

Inspection Rating Information (Based on a scale of 9)

Bridge Deck Rating	4 Poor
Superstructure Rating	7 Good
Substructure Rating	5 Fair

Rating Definitions

9 Excellent
8 Very Good
7 Good
6 Satisfactory
5 Fair
4 Poor
3 Serious
2 Critical
1 Imminent Failure

Deficiencies

- The bridge is structurally deficient with a poor deck rating
- The lane and shoulder widths are substandard
- The horizontal and vertical geometry is substandard
- The bridge is undersized hydraulically

Looking South over Bridge



Looking North over Bridge



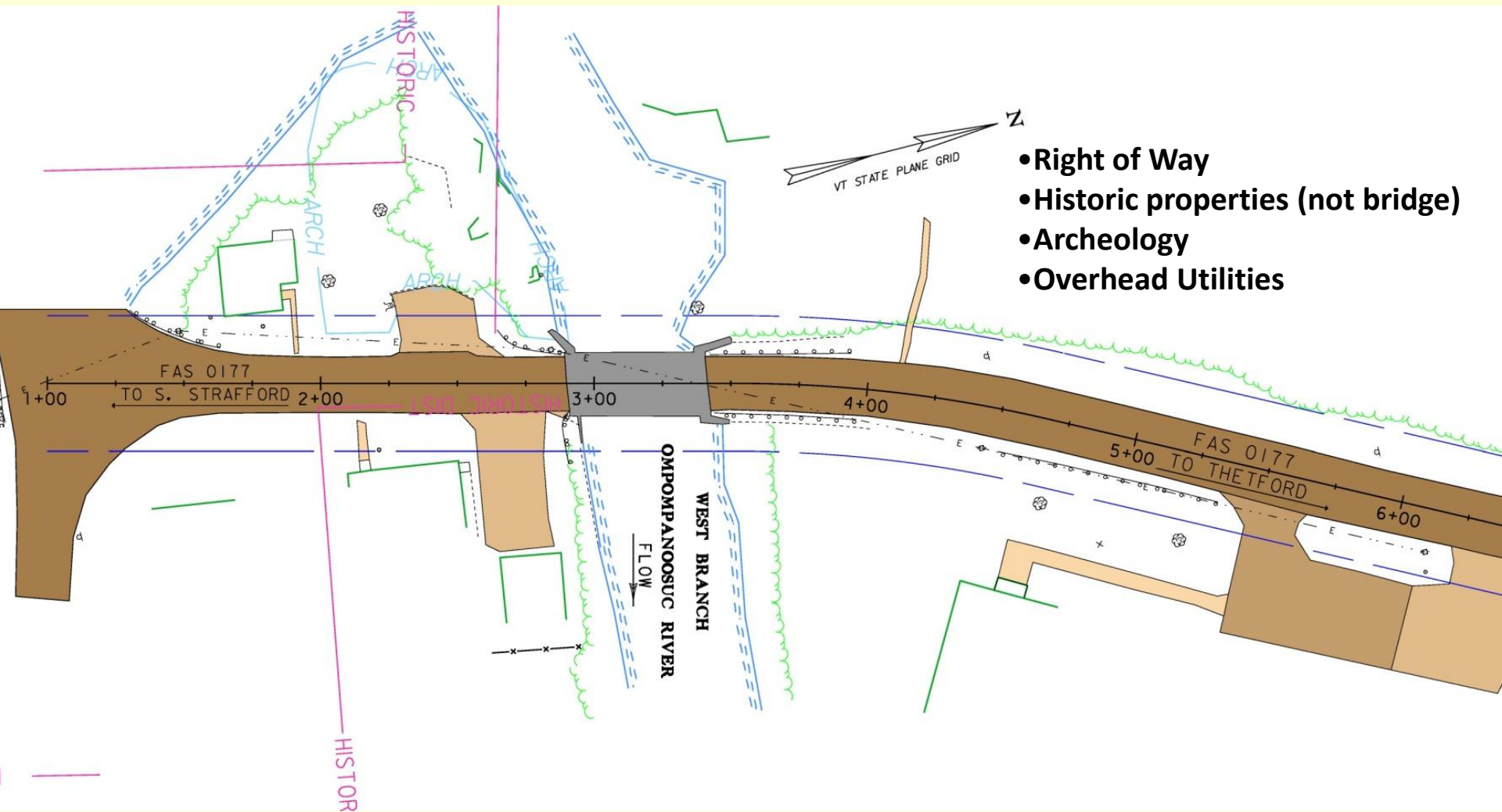
Underside of Deck



North Abutment



Layout Showing Constraints



Alternatives Considered

- Rehabilitation - Patching
- Full bridge replacement

Note: The method to maintain traffic during construction will be considered separately later in the presentation

Rehabilitation Details

- Patching/Repair of deck and substructures
- Cathodic protection to mitigate deterioration

Advantages include:

- Small investment
- Project can be developed quickly
- Minimal impact to properties and environment

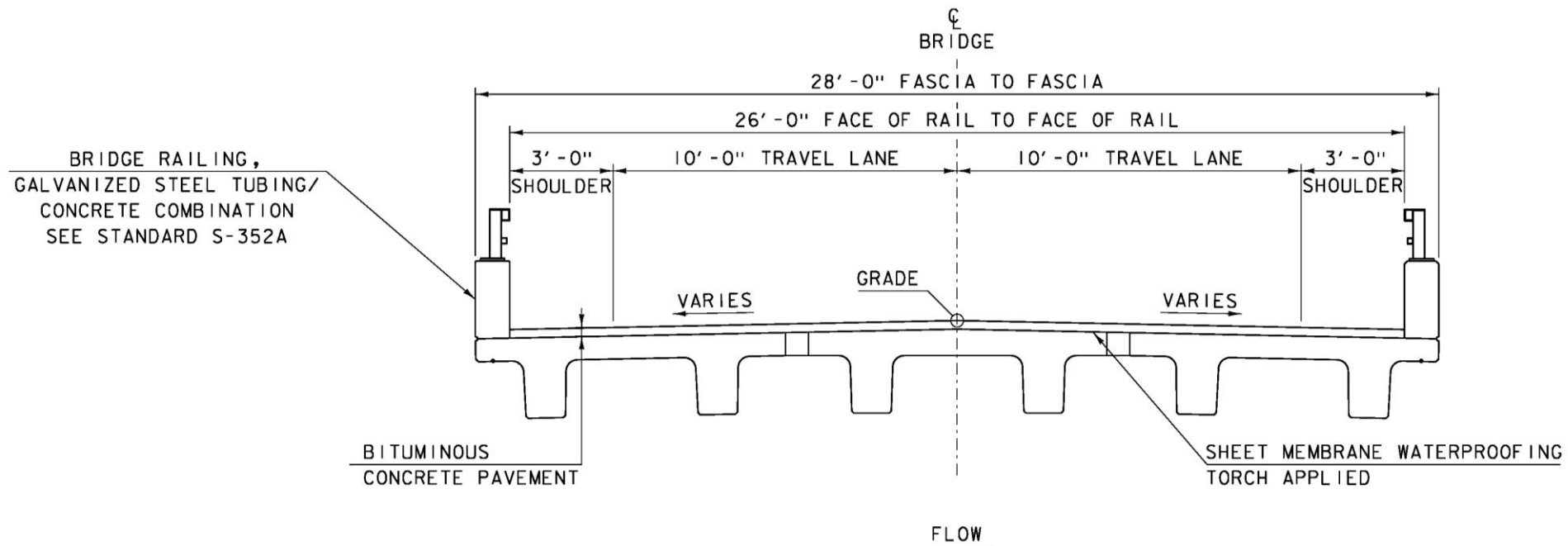
Disadvantages include:

- Short-term fix
- Only addresses structural problems
- Other substandard features would remain

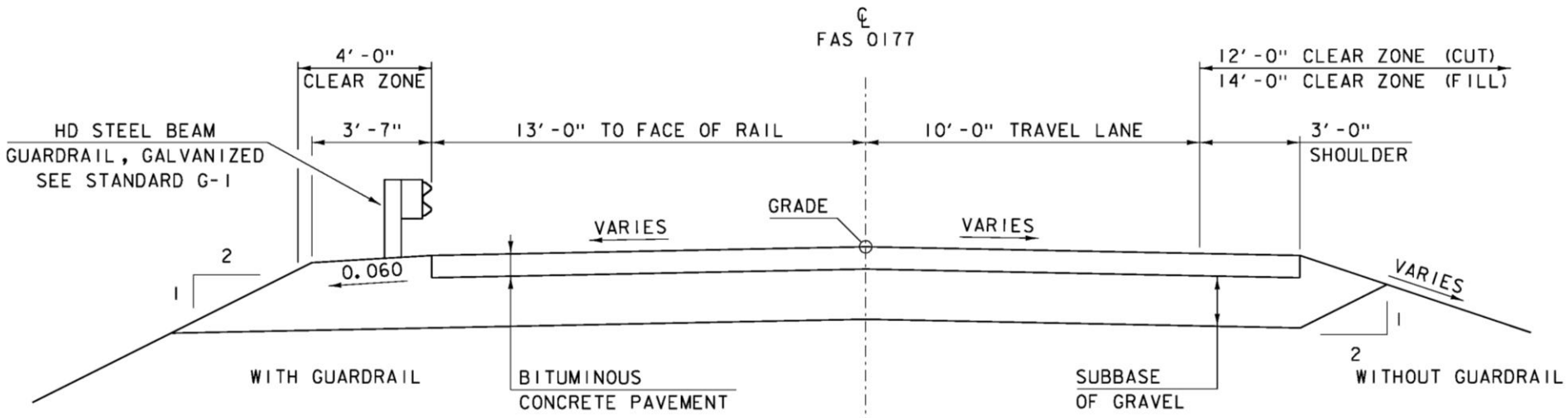
Full Bridge Replacement Details

- Complete Bridge replacement warranted
- 60' span w/ substructure on steel H piles
- 26' width between face of rail
- Maintain existing centerline of bridge
- Maintain approximate vertical grade of bridge
- Long term (80 year) solution

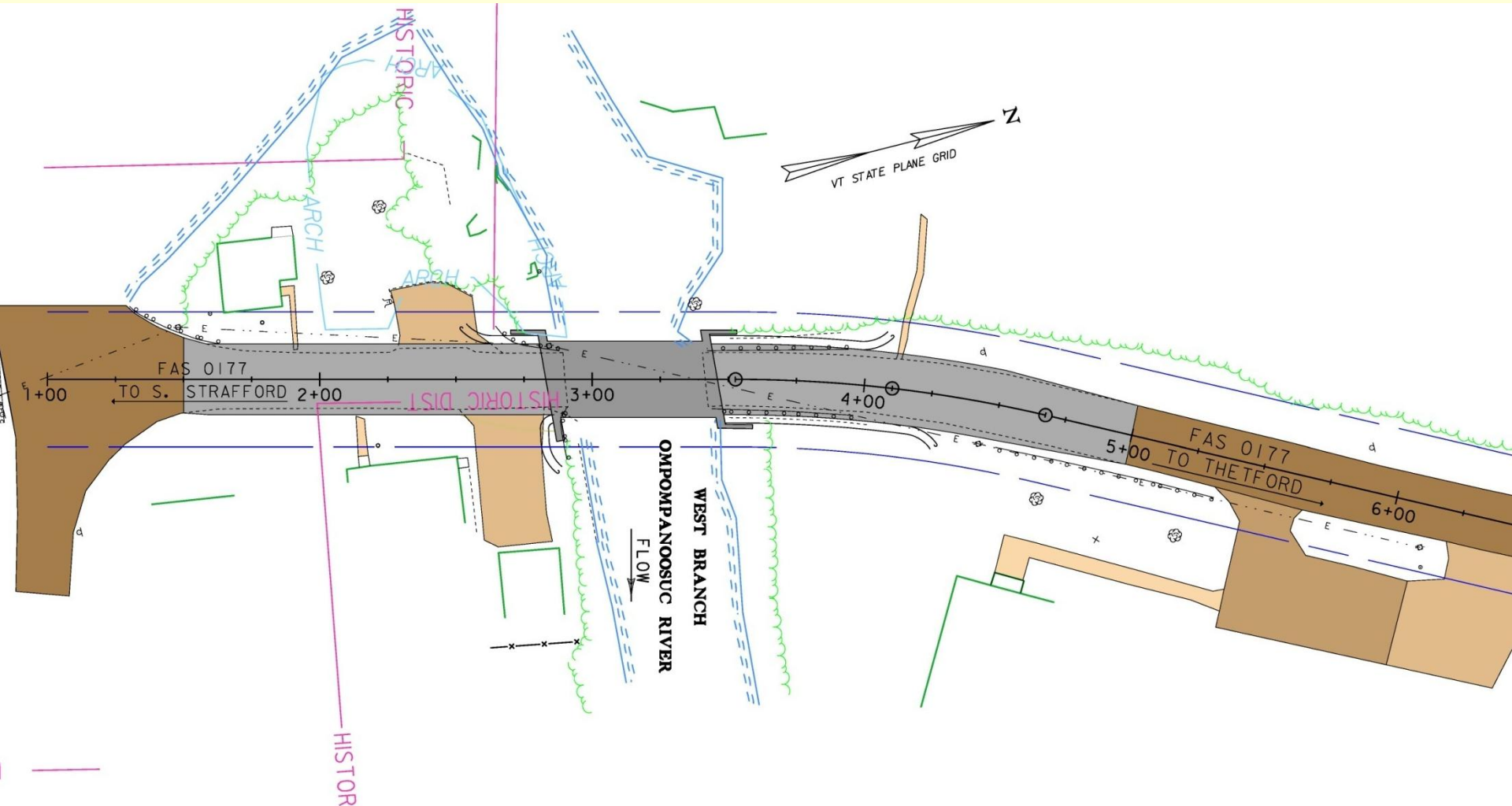
Bridge Typical



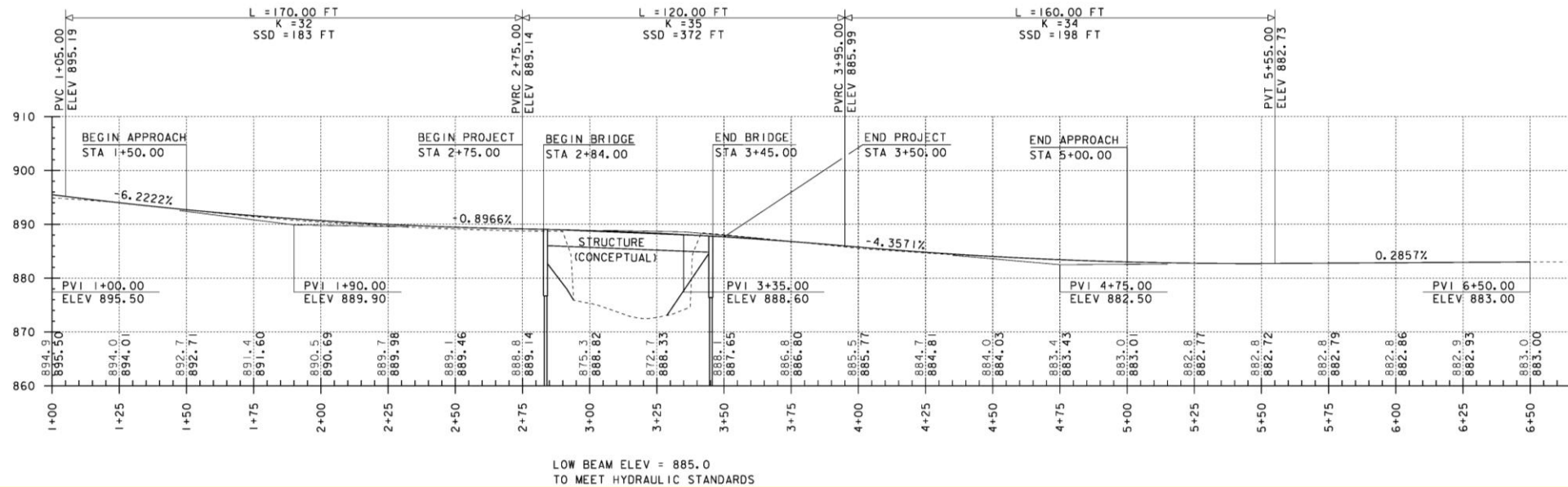
Roadway Typical



Full Replacement - Layout



Full Replacement - Profile



Recommendation on Alternatives

- VAOT recommends Complete bridge replacement
- Good funding sources from Federal/State (90-95%)
- Long-term fix

Methods to maintain traffic will be based on
recommended alternative

Methods to Maintain Traffic

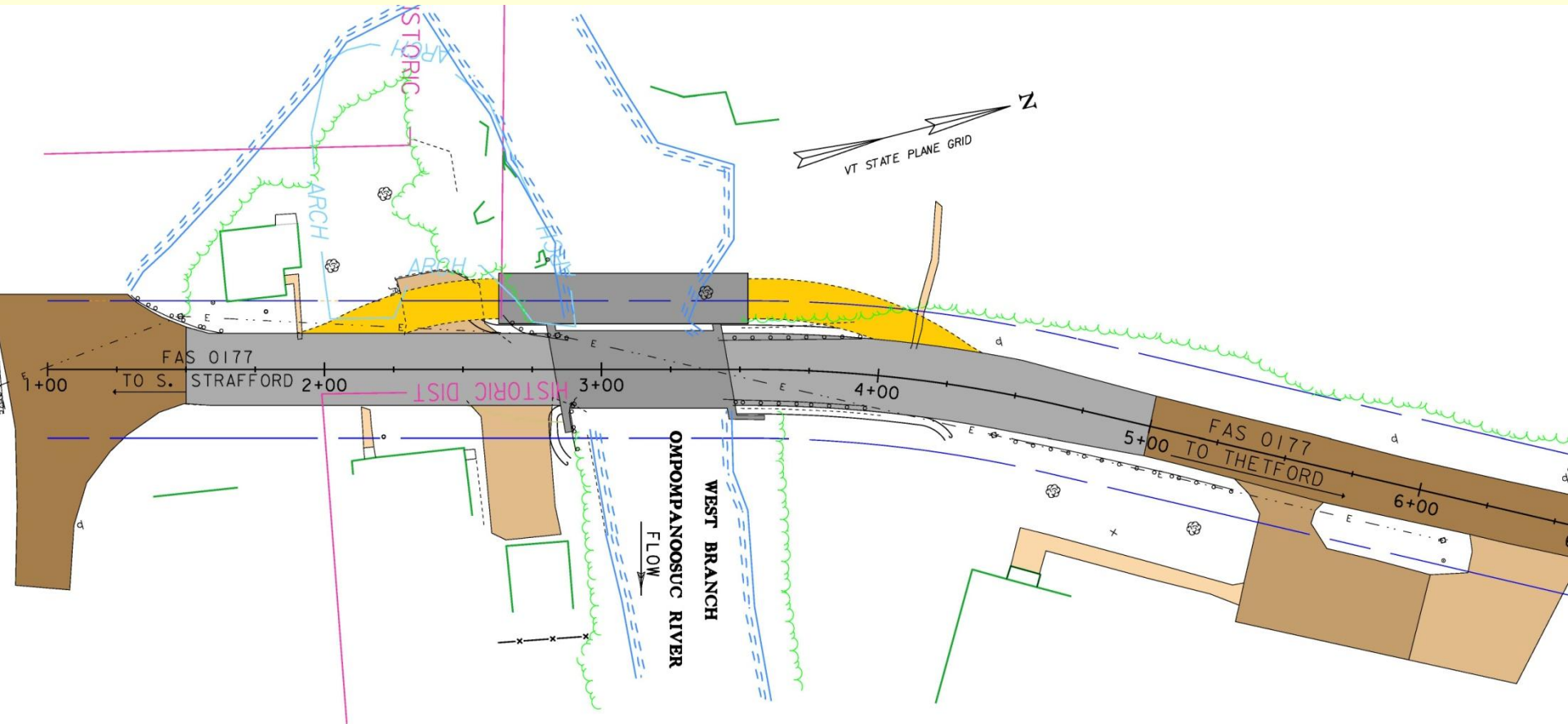
- Temporary Bridge
- Phased Construction
- ABC w/ short-term bridge closure

Methods to Maintain Traffic

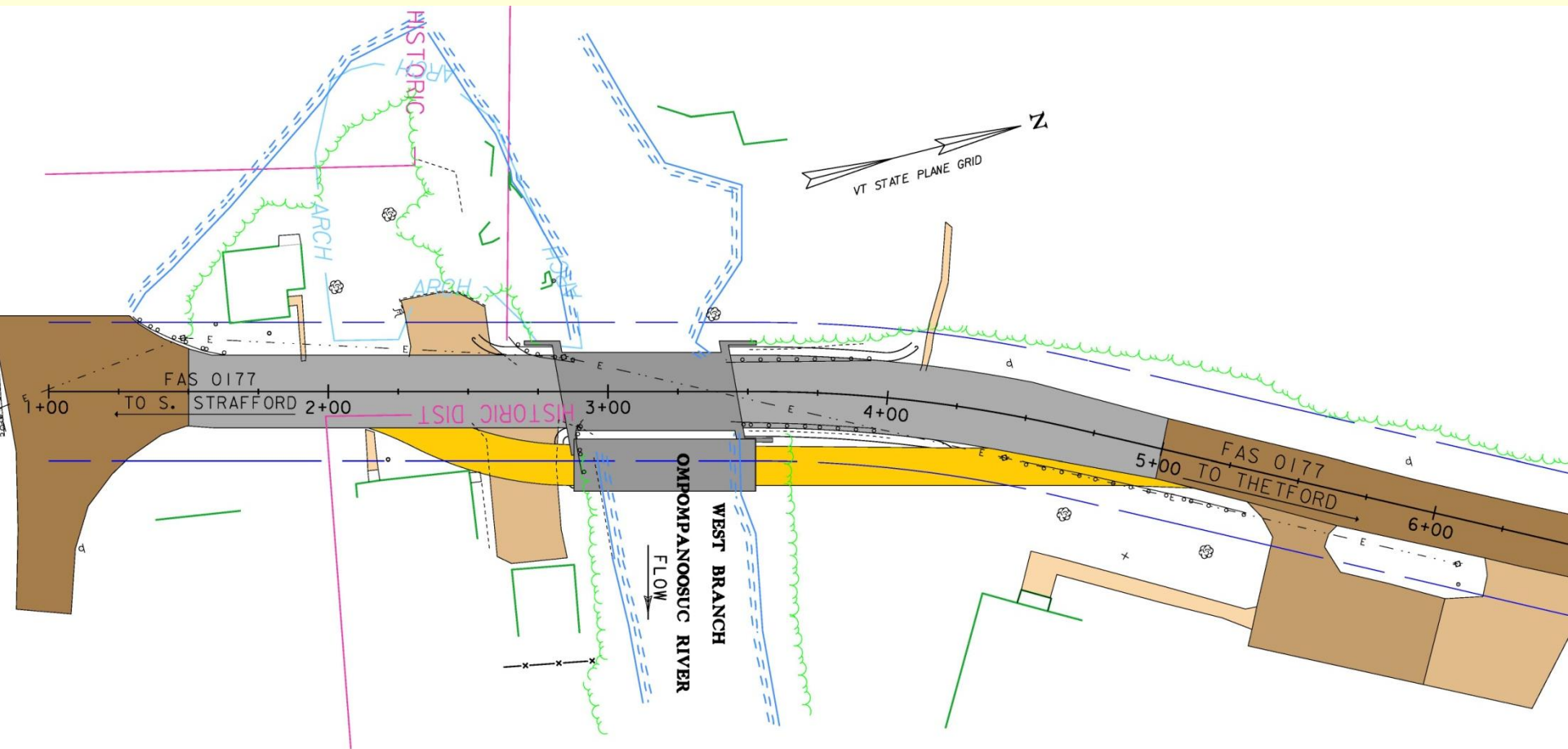
Temporary Bridge

- One-lane bridge with alternating traffic (no lights)
- Traffic congestion and/or conflicts w/ one-lane
- Environmental & Property Impacts
- Long project development process
- High cost of development and construction
- Consider both sides for possible location

Temporary Bridge - Upstream



Temporary Bridge - Downstream

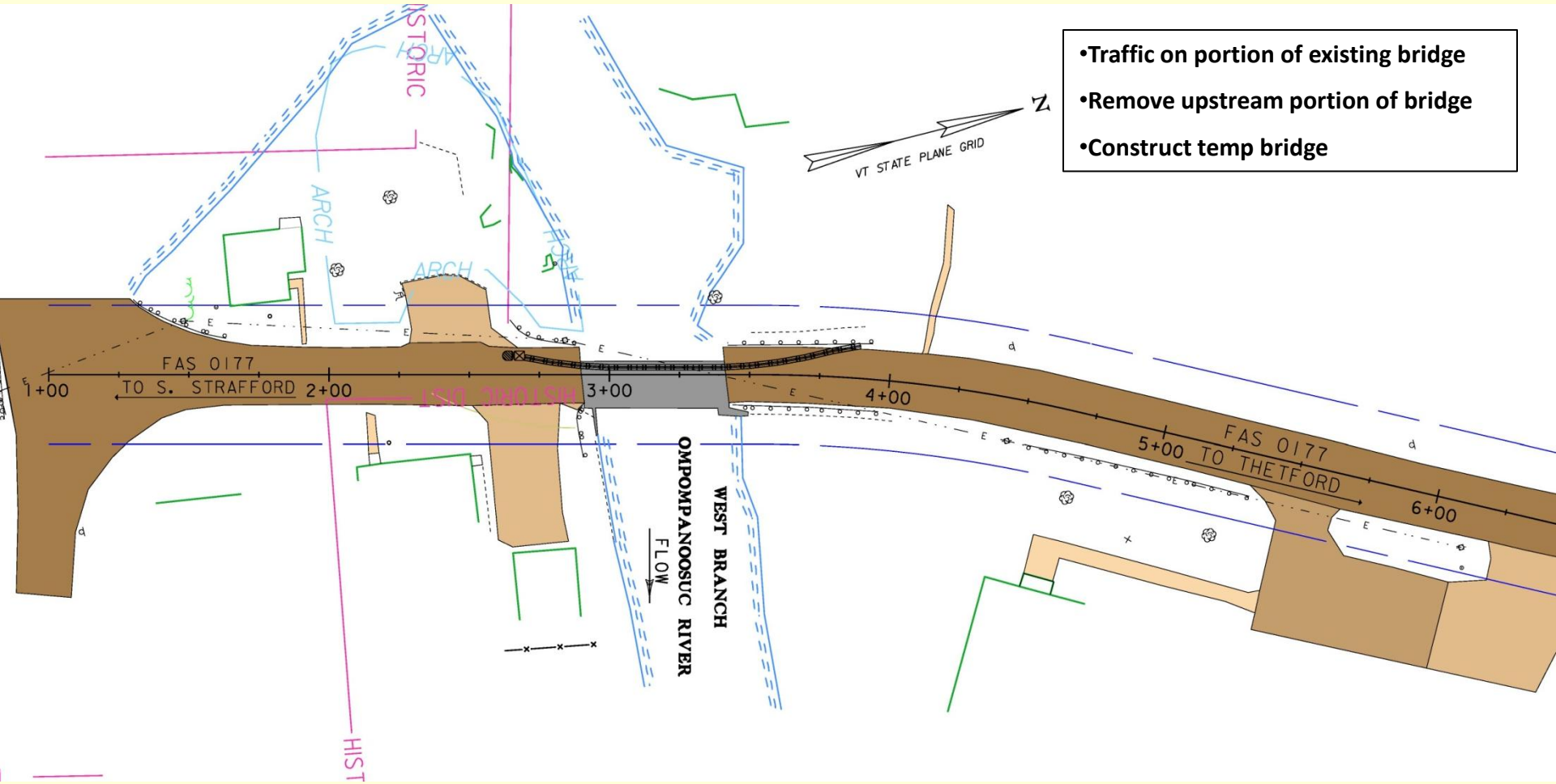


Methods to Maintain Traffic

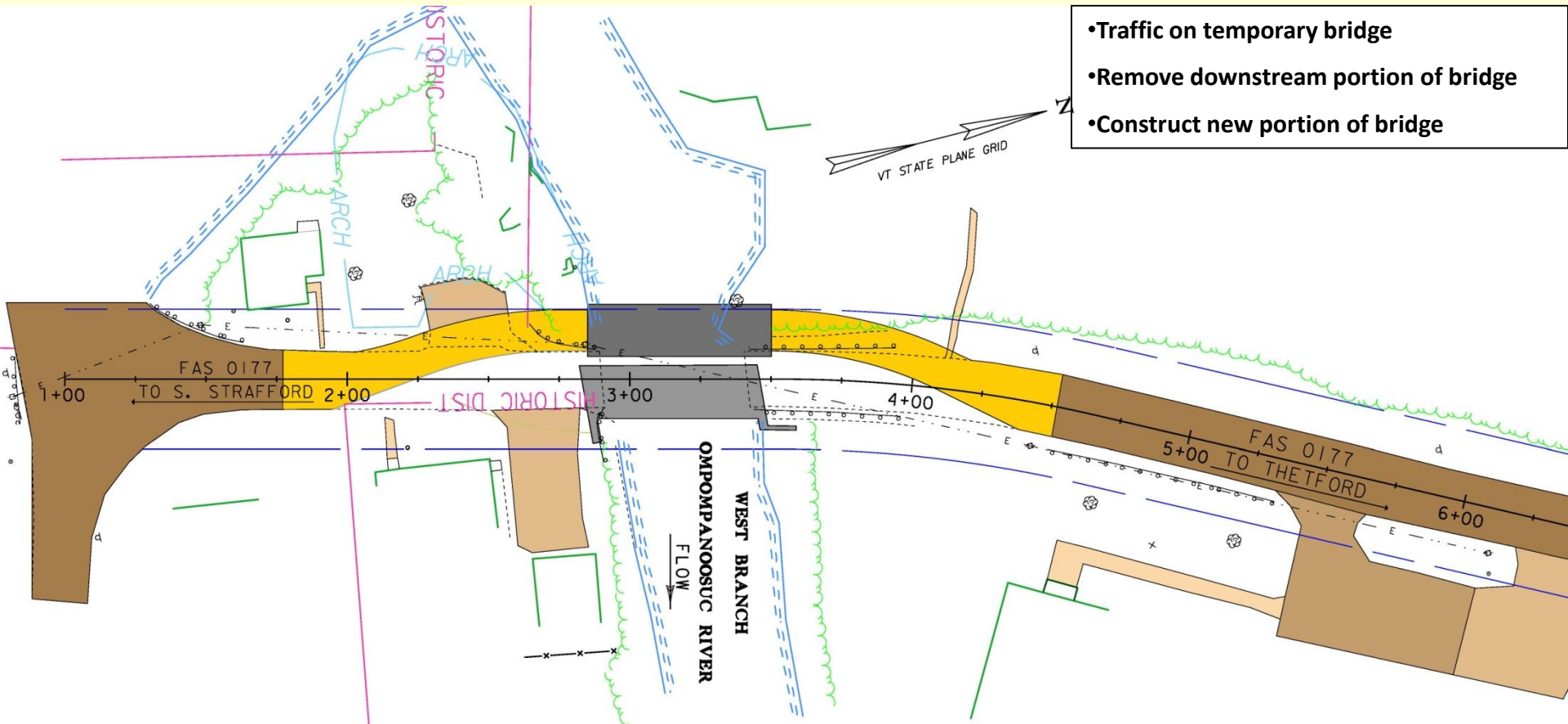
Phased Construction

- Traffic congestion and/or conflicts due to one-lane
- Much longer construction phase
- Safety concerns w/ motorists near workers
- Need 3 phases due to existing narrow bridge width

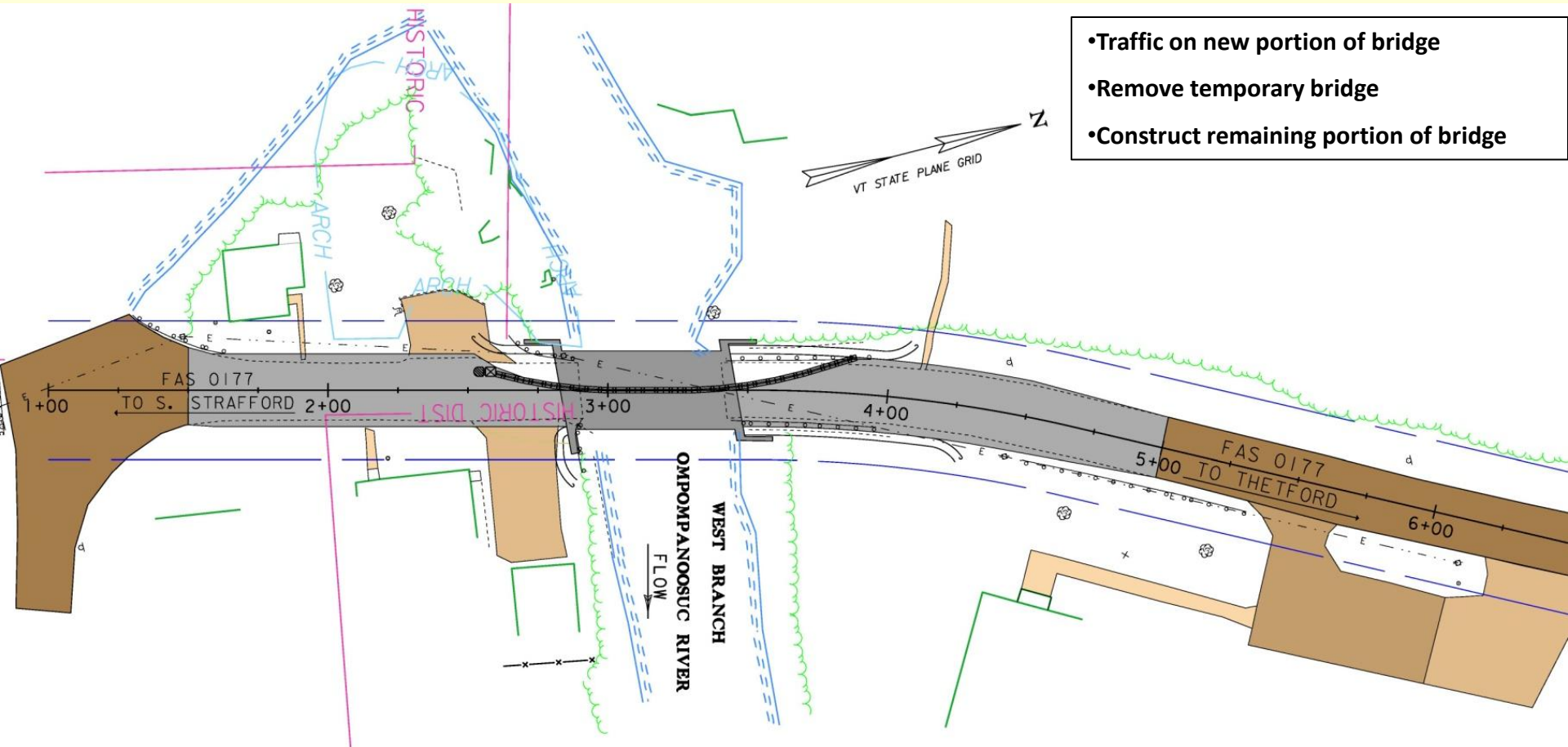
Phased Construction – Phase 1



Phased Construction – Phase 2



Phased Construction– Phase 3



Methods to Maintain Traffic

Short-term bridge closure with detour

- Recommended method to be discussed further

ABC with Bridge Closure Option

- Bridge 29 to be closed for 28 days (maximum)
- Allow 24/7 construction during bridge closure
- Contract incentives/dis-incentives to encourage contractor
- Community would have input on time of closure (between June 1 and September 1)
- Town will be responsible for detour route
- Public Outreach to provide advance notice for planning
- Local share will be cut in half (10% reduced to 5%)-

Accelerated Bridge Construction Examples

- We have been using ABC methods to build bridges since 2007 on approximately 20 projects.
- The following slides show some examples of past projects

Accelerated Bridge Construction



Driven steel piles with precast concrete cap for abutment

Accelerated Bridge Construction



The first of three Precast Concrete Caps being placed

Accelerated Bridge Construction



Precast concrete Abutment in place and ready for Superstructure

Accelerated Bridge Construction



Precast Concrete NEXT Beam lifted into place

Accelerated Bridge Construction



The second NEXT Beam being placed

Accelerated Bridge Construction



Three NEXT Beams in place with the final unit ready

Accelerated Bridge Construction



Precast Bridge Unit (PBU) delivered to site

Accelerated Bridge Construction



Precast Bridge Unit (PBU) lifted onto abutments

Accelerated Bridge Construction



Precast Bridge Units (PBUs) connected together

Alternatives Matrix

	Rehabilitation	Replacement w/ ABC and off-site detour	Replacement w/ Temporary Bridge	Replacement w/ Phased Const.
Maintenance of Traffic	\$25,000	\$25,000	\$200,000	\$50,000
Construction w/ CE + Contingencies	\$232,700	\$1,093,800	\$1,333,800	\$1,306,300
Preliminary Engineering	\$62,700	\$218,800	\$266,800	\$261,300
Right of Way	\$0	\$54,000	\$85,400	\$69,700
Total Project Cost	\$295,400	\$1,366,600	\$1,686,000	\$1,637,300
Town Share	\$14,770 (5%)	\$68,330 (5%)	\$168,600 (10%)	\$163,730 (10%)
Design Life	20 Years	80 Years	80 Years	80 Years
Project Development Duration	1 year	4 years	4 years	4 years
Construction Duration	4 months	6 months	18 months	18 months
Closure Duration	None	28 days	None	None

Conclusion and Recommendation

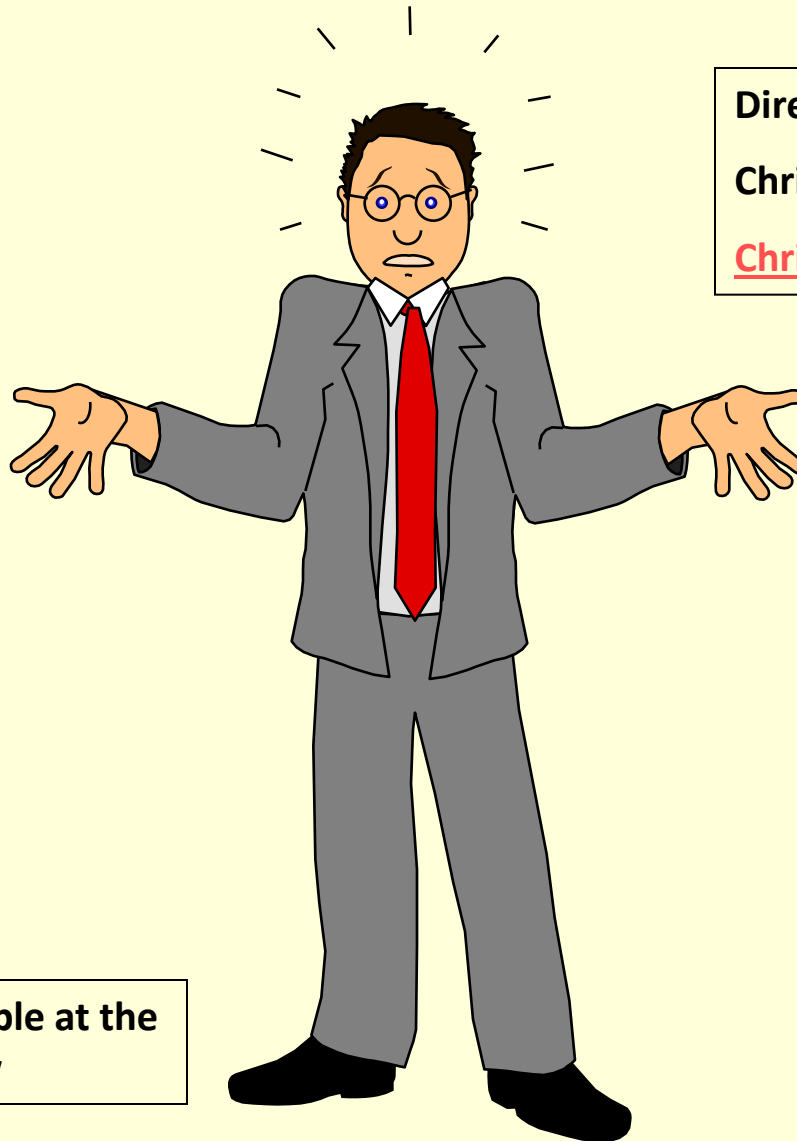
- Full Bridge Replacement using ABC & short-term closure
- Long term (80 year) fix
- Addresses all sub-standard features
- Project Development time minimized
- Minimal mobility impacts
- Minimal impact to environmental resources
- Minimal impact to adjacent property owners
- Takes advantage of reduced local share for closure--

Next Steps

This is a list of a few important activities expected in the near future and is not a complete list of activities.

- Wait to hear Town response to recommendation
- Develop Conceptual Plans
- Request another public meeting (if necessary)
- Environmental process (historics)

Questions



Direct any questions to:

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**This presentation is available at the
web address shown below**

<https://outside.vermont.gov/agency/vtrans/external/Projects/Structures/13J088>